

A GeBPSG TOP CLAD FOR A PLANAR LIGHTWAVE CIRCUIT

ABSTRACT OF THE DISCLOSURE

5 A method of depositing a top clad layer for an optical waveguide of a
planar lightwave circuit. A GeBPSG top clad layer for an optical waveguide
structure of a planar lightwave circuit is fabricated such that the top clad
layer comprises doped silica glass, wherein the dopant includes Ge
(Germanium), P (Phosphorus), and B (Boron). In depositing a top clad layer for
the optical waveguide, three separate doping gasses (e.g., GeH_4 , PH_3 , and
10 B_2H_6) are added during the PECVD (plasma enhanced chemical vapor
deposition) process to make Ge, P and B doped silica glass (GeBPSG). The
ratio of the Ge, P, and B dopants is configured to reduce the formation of
crystallization areas within the top clad layer and maintain a constant
refractive index within the top clad layer across an anneal temperature range.
15 A thermal anneal process for the top clad layer can be a temperature within a
range of 950C to 1050C. The GeBPSG top clad layer reduces the insertion loss
of passive arrayed waveguide grating devices and active planar lightwave
circuit devices.